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Servers, Storage and Facilities Data Collection Kickoff

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Meeting Objectives

- Kickoff the data collection effort for servers, storage and facilities
- Define benchmarking scope
- Review benchmarking models
- Data collection template walk-through
- Operator will take questions during the call, questions will be answered at the end of the call
- The meeting will be recorded for future playback
- Q&A

Data Collection
Timing and process for questions.

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- Timing
  - Agency data collection will begin the week of July 3.
  - Agency data collection will take place over a period of 5 (five) weeks and will conclude by August 4th.
- Questions
  - Submit questions and any documents to DIS (Scott Utley and Steve Hulsey)
  - DIS will forward questions and documents to Gartner
- Data Collected
  - Agencies will provide data for assets and workload owned and operated by the agency, not services performed by DIS
  - If DIS and your agency share costs and workload, it will be necessary to work together to ensure that there is no overlap

Data collection approach

- Complete the following data collection template:
  - Gartner Benchmark Data Collection Questionnaire non-DIS Agencies.xlsx
    - This worksheet contains tabs for server technologies Windows, Linux, Unix, Storage, Facilites

Data collection guidelines

- Provide data for Fiscal 17, annualize as needed
- Best Data Within Allotted Timeframe
- Not an Accounting-level Exercise (No decimal points)
- Accuracy +/-10% or So Is Acceptable
- One Approach
  - First Pencil In Estimates
  - Then Refine Figures as Time Permits
- Document Assumptions and Retain Worksheets Internally
  - Likelihood of reuse is high during subsequent annual updates
- Start ASAP!
- Count all units in scope of benchmark
- Units must match cost and staff
- Count fully depreciated units still in service
- Hardware includes expenses, depreciation, lease and maintenance
- Software includes maintenance and expensed purchases
- Personnel costs include benefits and should match total full time equivalent (FTE), no FTE should be counted more than once

Data collection concepts

- Gartner uses Sourcing Types to classify costs. This is the classification of who is delivering the service for which you are providing cost or headcount:
  - Insource: includes the spending (purchases, depreciation and personnel costs) and head count for in-house resources.
  - Contractor: includes the spending and head count for contract labor that is supplemental to existing in-house staff and is “operationally” managed by in-house staff.
  - Outsource: includes the fees for outsource contracts in which outsource is defined as any situation where the full operational responsibility for IT services is completely handed over to an external service provider. This also includes telecom carrier costs.
  - Maintenance: includes the fees for maintenance contracts (i.e., time and materials) that are not embedded in the purchase price of the asset and, therefore, are separable from depreciation. Hardware and software maintenance is included here. Maintenance is differentiated from outsource in that the asset is still managed internally with the staff calling in maintenance support as appropriate.
  - Reporting maintenance costs for hardware - if maintenance costs for hardware can be separated out, they can be reported under hardware and categorized with a sourcing type of maintenance.

Questionnaire Walk-Through

SERVERS, STORAGE, FACILITIES

Servers
Data model

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Server-based Computing Data Model

Hardware	▪ Processors (mainframe, servers) ▪ Internal Disk Storage
Software	▪ Operating Systems ▪ Virtualization ▪ Database/Database Management ▪ Middleware ▪ Messaging ▪ Security
Connectivity	▪ Intra-Data Center Connectivity ▪ Inter-Data Center Connectivity
Disaster Recovery	▪ Hardware ▪ Software ▪ DR "Hot Site" ▪ DR Connectivity
Occupancy	▪ Power/Heat Management ▪ Raised Floor ▪ Office Space
Personnel	▪ Technical Support (operations and technical services) ▪ Planning and Process Management ▪ Administration (includes management)

- Key Data Collection Concepts
  - Workload
    - Server operating system instances
    - Physical servers
  - Costs
    - Annual hardware cost for servers
    - Annual software costs associated with the server, n the applications running on it
    - Annual disaster recovery
    - Annual data center connectivity
    - Annual facilities and occupancy
  - People supporting the Servers:
    - System administration
    - Monitoring
    - Production control
    - Server security
    - Management

Source: Gartner, Inc.

Reporting Server Workload

Windows Workload	
Total Number of Physical Servers (Boxes)	0.00
Total OS Instances	0.00

Linux Workload	
Total Number of Physical Servers (Boxes)	0.00
Total OS Instances	0.00

Unix Workload	
Total Number of Physical Servers (Boxes)	0.00
Total OS Instances	0.00

Scope: Includes all servers owned and operated by your agency. Examples include active directory, e-mail, applications servers, development and testing, file and print, database, etc.

- Report the number of physical servers supported by your agency during the year.
  - If the servers are “on the books” and are currently an expense to the agency, they are to be included in scope, whether they are activated or powered off.
- Fully depreciated units still in service are counted.
- Report the number of virtual operating system instances.
- Usually this information has to be completed or verified by staff managing the server area.

Source: Gartner, Inc.

Server Cost
Costs / spending data collection

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Sourcing Type		Insourced	Outsourced	Contractor	Maintenance
Budget Type		Direct	Direct	Direct	Direct
Region Located					
Spending					
Non-Personnel					
Hardware	$0	$0	$0		$0
Software	$0	$0	$0		$0
Disaster Recovery	$0	$0	$0		$0
Occupancy	$0	$0	$0		$0
Unallocated (Non-Personnel)	$0	$0	$0		$0
Total Non-Personnel	$0	$0	$0		$0

- Report annual hardware, software, disaster recovery costs here, grouped by sourcing types
- Costs much match the workload supported
- Hardware: Annual expense, lease, depreciation, maintenance, installation and taxes, as appropriate, for all hardware assets
- Software: Annual license and maintenance costs, as well as costs associated with new purchases and upgrades
- Disaster Recovery: Dedicated costs only, such as a contract or fully dedicated (no production)
- Unallocated: For input of costs where a breakdown is unknown such as outsourcing

Source: Gartner, Inc.

Server Cost Definitions

- Hardware: Annual depreciation, expense, lease and maintenance for server hardware: Includes all hardware in server platform configurations, including internal disk storage (but NOT external disk arrays), processors, memory, cards, etc. If depreciation is not available, take ¼ of purchase price in last four years.
- Software: Annual license purchases and software maintenance. Software is not depreciated. Operating System: Include annual costs of both host and virtual OS licenses. Include the following:
  - Virtualization and Partitioning: hosted Virtual Machine Managers (VMMs) — (e.g., EMC's VMware Server GSX, MS Virtual Server (VS)) and hypervisors — (e.g., VMware ESX, Open Source Xen, MS “Viridian”).
  - Utilities (non-storage): e.g., for performance monitoring, job scheduling, change management.
  - Database: Annual costs of DBMS licensing e.g., Oracle, SQL Server. Include costs for both host and virtual OS systems. Do not include applications cost.
  - Middleware: Annual costs of software used to allow applications to interact and exchange data across diverse hardware and network environments, especially “plumbing” together different database structures.

Server Cost Definitions (continued)

- Content/Document Management and Search Engines: Annual costs of software used to manage and track the location of and relationships between content elements within a data repository, in particular Web pages (e.g., Documentum). DO NOT INCLUDE any Web development tools or languages such as WebSphere or Java.
- Messaging: Annual costs of software executing on servers which provides email and messaging services to users (e.g., MS Exchange).
- Communications: Annual costs of communications software specific to the mainframe, midrange servers and/or data center (but not including the storage area network — SAN).
- Security: Include annual cost of all software used to provide access security and protection against server attacks (e.g., anti-spam, anti-malware, antivirus, Web filtering, intrusion prevention systems, activity monitoring, n/w firewall). Include also the costs of software for developing and managing virtual security partitions (VSPs).

Server Cost Definitions (continued)

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- Disaster Recovery (DR) Dedicated DR only
  - If the hardware and software used for DR "doubles up" and is also used, in whole or part, to provide a test and development environment, the costs should reported as hardware and software rather than DR.
  - DR Contract (Compute and Communications): If DR services cannot be separated into all the elements in this section, enter the total annual DR costs in this row. This includes hot site hardware, software and connectivity associated with the DR services.
  - DR Hot Site (Shell Facility): Annual rental, service, maintenance or other costs of maintaining an alternative "hot site" location for DR purposes so that critical systems can be migrated to run out of this site within agreed (and fairly tight) timescales if the normal data center suffers a disaster and is unable to function or recover quickly.
  - DR Dedicated Hardware: Annual rental or depreciation costs of hardware located and maintained at the DR "hot site."
  - DR Dedicated Software: Annual software license and support costs of duplicate software maintained on devices located at the DR "hot site."
  - DR Dedicated Connectivity: Annual cost of communications devices, software and network connections (rentals) specifically between the operational data center(s) and the DR site(s).
- Occupancy (Non-Data Center Floor Space)
  - Note: Expenses related to data center facilities management are included in the Facilities functional area
  - Occupancy costs should include fully burdened costs for the non-data center floor space being used by the staff supporting the enterprise computing environment under analysis. Some examples include office space, furniture, electricity, maintenance, property taxes, security and office supplies.

Server Personnel Cost
Personnel costs data collection

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Sourcing Type		Insourced	Outsourced	Contractor	Maintenance
Budget Type		Direct	Direct	Direct	Direct
Region Located					
Personnel	$0	$0	$0	$0	$0
Unallocated (Total Cost)	$0	$0	$0		$0
Total Cost	$0	$0	$0	$0	$0

- Report fully burdened personnel costs for all FTEs and any outsourcing, grouped by sourcing types.
- Although Gartner will ask for FTE counts by categories (see next slide), such as operations, technical etc. it is not necessary to report the costs for each individual FTE. That is, the cost reported under Personnel is for all of the FTEs reported in the staffing section.
- For in-house staff, personnel costs include salary (including overtime pay), benefits and “other” employee costs such as travel and training.
- “Benefit load” should include costs for bonuses, paid holidays, vacation, medical/dental coverage, life and accident insurance, retirement plans, stock plans, disability, social security, unemployment compensation, dependent care, tuition reimbursement and employee assistance programs (for example, physical exams, exercise programs and similar costs). Exclude costs related to human resource department staff allocations, early retirement incentive bonuses and internal “cross-charges” for corporate overhead such as for the chairperson’s salary.
- For contractors and consultants, include all compensation that was paid directly to the individual.

Source: Gartner, Inc.

Server FTE
Personnel FTE data collection

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Sourcing Type		Insourced	Outsourced	Contractor
Budget Type		Direct	Direct	Direct
Staffing				
Operations / Maintenance	0.00	0.00		0.00
Engineering / Technical Services	0.00	0.00		0.00
Planning & Process Management	0.00	0.00		0.00
Services Administration	0.00	0.00		0.00
Management & Administration	0.00	0.00		0.00
Unallocated (Total FTE)	0.00	0.00		0.00
Total FTE	0.00	0.00		0.00

- Report FTEs, in-house and contractors, by role. A person should not be counted more than once. The total cost for the FTEs is reported in the Personnel cost section (see previous slide).
- Management of functions are included and may need to be prorated across multiple towers. For example, a Data Center Operations Manager may be allocated across servers.
- Administration is in-scope, this includes portions of individuals managing contracts, asset management etc. Note that this is within the tower being analyzed.
- If a role is less than 5% of someone's time, it may be excluded.

Source: Gartner, Inc.

Server FTE
Personnel FTE data collection

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- Operations/Maintenance
  - Operations Support: responsibility for overall efficient operation of installed computer systems, such as System start/stops, Monitoring system jobs, responding to console messages, Diagnosing and correcting production failures are part of operations support. Typical positions: Shift supervisors, shift operators, and operations automation. Include only implementation staff here, not those devising or measuring the process.
  - Production Control: maintain the integrity of the production environment, specifically: Turnover of applications from test into production after the systems have been developed and tested, Ensuring that systems to be placed in the production environment meet certain standards, Providing job procedural documentation such as scheduling requirements and rerun procedures, Establishing and adjusting the batch job schedule, Providing ongoing job monitoring, Reviewing the service level of production jobs to improve quality and/or efficiency Typical positions: Production turnover, production scheduling and production monitoring. Include only implementation staff here, not those devising or measuring the process.

Source: Gartner, Inc.

Server FTE
Personnel FTE data collection

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- Engineering/Technical Services
  - Change and Release Management: includes evaluation, installation, maintenance (e.g., fixes and upgrades) as well as removal of system software, security packages, systems utilities and database transaction packages. Entire life cycle from initiation and recording, through filtering, assessment, categorization, authorization, scheduling, building, testing, implementation and eventually their review and closure.
  - Problem and Incident Management: Incidents from detection and recording through diagnosis to resolution and closure, but not the first-line IT Service Desk. Manage all major Incidents and Problems, while endeavoring to record all workarounds and "quick fixes" as Known Errors where appropriate, also raising Changes to implement permanent structural solutions wherever possible. Problem Management further analyses and trends Incidents to proactively prevent the occurrence of repeat or associated Incidents and Problems. Includes systems administrators.
  - Performance Monitoring and Management: Establishes technical standards, monitors key components of the infrastructure and applications services to collect metrics for review, takes key measures and reports, and reviews them against targets, to determine if actions are required to manage the service more compliantly. This Involves tuning system performance in reaction to monitoring work.
  - Physical Database Administration: Monitoring, loading, installing, patching, and maintaining the file structure and user privileges for the DBMS software (e.g., Oracle, SQL, DB2).
  - Capacity Management: Ensuring that adequate capacity is available at all times to meet requirements. Contributes to a Capacity Plan, covering business, service and resource capacity management.
  - System Security Management: in relation to the servers, including all aspects associated with procedures for and reaction to security incidents. Includes assessment and management of risks. Includes System Access (controlled, for example, by user-id and password), Standards for file access software (security software), and Auditing system security and correcting violations. Typical positions: Security Analyst Personnel involved in ad hoc activities around developing security policies and documentation are also included here.

Source: Gartner, Inc.

Server FTE
Personnel FTE data collection

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- Planning and Process Management
  - Systems Researching and Planning: Current and future technology needs - project portfolio management, the development of plans for major initiatives such as mass product or application migrations, and research of new technologies. Also design, build, evaluation and testing of new products, packages, systems, tools and images.
  - Process Development and Management: Development and establishment of formal policies and documentation around the connected sets of activities that define IT processes for the servers, plus the ongoing oversight and control (but not the actual carrying out) of these processes. Processes include, but are not limited to, Configuration Management, Incident/Problem Management, Change Management, Release Management, Security Management.
  - Project Management: Specific labor overhead for activities related to organizing and managing IT resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints. A project is a temporary and one-time endeavor undertaken to create a unique product or service. This category includes only the organizing and managing of IT projects. Activities other than organizing and managing should be included in the Technical Services/Engineering, Operations, or Management categories.
  - Data Center Disaster Recovery: Producing recovery plans for the mainframe and midrange operational services designed to ensure that, following any major Incident or sudden, unplanned calamitous event causing or potentially causing disruption of the service, IT services are provided to an agreed level within an agreed schedule. It should be recognized also that IT service continuity or disaster recovery is only one component of Business Continuity Planning (BCP). The objective is to assist the business and BCP to minimize the disruption of essential business processes during and following a major Incident. The process includes such activities as business impact analysis, risk analysis and risk management exercises, maintaining disaster recovery documentation, conducting periodic tests and audits, and negotiating contingency site arrangements. However, ONLY INCLUDE costs/FTEs related to IT personnel and infrastructure. While there are other functions around disaster recovery/business continuity such as developing manual processes, and ensuring business unit personnel are able to function, they are not within the scope of this definition. As these costs are often combined in budgets it may be necessary to allocate out the portion related to IT personnel and infrastructure.

Source: Gartner, Inc.

Server FTE
Personnel FTE data collection

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- Services Administration
  - Budget, Chargeback and Service Level Reporting
  - Product Management
  - IT Training (training taken by IT staff)
  - Asset Management
  - Procurement
  - Asset and Configuration Tracking
  - Business and Relationship Management
  - Contract and Service Provider Management
- Management and Administration
  - Tasks include but are not limited to setting strategic direction, communications activities, hiring and firing of staff, personnel performance reviews, expense management, approving relevant documents, planning day to day personnel workload etc. Time spent by managerial personnel on non-supervisory or departmental administration tasks (for example a data center supervisor who spends half his time managing servers) should be represented in the relevant category.
  - IT Administration: Support staff for IT managers which typically include secretary, receptionist and administrative assistant, who provide direct administrative and clerical support.

Servers
Frequently Asked Questions

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- In situations where x86 systems run with Linux or Windows as the master OS plus VMWare or Hyper-V for virtualization, there will be flexibility for the virtual OS instances setup on top of either based on Windows or Linux.
- Allocate the costs and volume data of these mixed environments entirely to the one or other technology (Windows or Linux) based on the volume majority (>50%) on this environment being either Windows or Linux x86 virtual OS instances.
- Each blade server is counted as one physical server. The blade enclosure is not counted as a physical server. Each blade server is identified by the chip architecture with which it is associated, either RISC (UNIX) or x86 (Linux or Windows), regardless of whether the server is 32-bit or 64-bit.

Servers
Frequently Asked Questions

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- What are the Physical DBA tasks in scope?
  - Install the DBMS software
  - Maintain the DBMS software
  - Maintain the links with other major system and subsystem components: network, security, performance monitoring, etc
  - Obtain, allocate and initialize the storage spec from the storage management team
  - Implement the backup, redundancy and disaster recovery requirements of the database storage
  - Implement fallback, failover provisions for event recovery
  - Test security, fallback, failover and new implementations
  - Perform Capacity Planning and Performance Management tasks
  - Respond to problem incidents related to DBMS software, DBMS performance including full system incidents or full system performance issues
  - Monitor DBMS performance, security, backup and failover status
  - Participate in Disaster Recovery tests
  - Tune physical layer of the database or subsystem interfaces

- What are the Logical DBA tasks out of scope?
  - Data modeling: Creating physical data model
  - Interface directly with the developers/analysts on the development of the logical data model
  - Create process to initialize, load and scrub data
  - Creating scripts to initialize and load the data tables
  - Write and/or tune stored queries
  - Maintaining data standards
  - Writing database documentation, including data standards, procedures and definitions for the data dictionary ('metadata');
  - Controlling access permissions and privileges
  - Tune logical/applications layer of the database or application interfaces

Storage
Data model

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Hardware	▪ Storage Controllers ▪ Storage Servers ▪ Offline Supplies
Software	▪ Storage Maintenance ▪ Reporting ▪ Security ▪ Monitoring ▪ Backup/Restore ▪ Archival ▪ Replication ▪ Media Handling/ Migration
Connectivity	▪ Intra-Data Center Connectivity ▪ Inter-Data Center Connectivity
Disaster Recovery	▪ Hardware ▪ Software ▪ DR "Hot Site" ▪ DR Connectivity
Occupancy	▪ Power/Heat Management ▪ Raised Floor ▪ Office Space
Personnel	▪ Disk and Tape Management ▪ Planning and Process Management ▪ Administration (includes management)

- Key Data Collection Concepts
  - Workload
    - Storage volume and type
  - Costs
    - Annual hardware cost for storage devices
    - Annual software costs associated with managing storage
    - Annual disaster recovery
    - Annual storage network connectivity
    - Annual facilities and occupancy
  - People supporting the Storage:
    - Storage administration
    - Management

Storage Workload

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Storage Inventory	
Type of Storage	
Tier 0	
Raw (TB)	0.0
Tier 1	
Raw (TB)	0.0
Tier 2	
Raw (TB)	0.0
Tier 3	
Raw (TB)	0.0
Tier 4	
Raw (TB)	0.0
Nearline & Deep Storage	
Raw (TB)	0.0

	Tier 0	Tier 1	Tier 2	Tier 3	Tier 4
Type of Storage	Enterprise Class SAN:		Midrange Class SAN:	NAS / iSCSI:	Direct:
Frame	e.g. IBM XIV, DS8x / 6x, FlashSystem EMC Symmetrix VMAX, DMX-4, XtremIO HDS HUS 130 / 150, VSP, USP HP 3PAR StoreServ 10x / 7x, XP7, P9x / UX Oracle FS1-2, Pillar Axiom, Huawei OceanStor 18x, 5000T, Sx900, Fujitsu DX8000-S2		e.g. IBM StorWize v7x, DS5x / 4x, EMC VNX, CLARiiON, HDS HUS 110, HP 3PAR StoreVirtual P6x/P4x/EVA, StoreEasy 5x, Dell Compellent, EqualLogic, Nimble CS	e.g. IBM SONAS, N series, EMC Isilon, Celerra, NetApp FAS, HDS HNAS, Dell FS, HP StoreAll, Oracle ZFS Huawei N8x, SGI NAS CORAID ZX3000	SATA DAS JBOD VTL
Hard Drive Speed	n/a	15,000 RPM	10,000 RPM	10,000 RPM	7,200 RPM
Disk Type	EFD, Flash, SSD	Fibre	Fibre, SAS	SAS, SATA	SATA
Connectivity	Redundant Fibre Channel SAN	Redundant Fibre Channel SAN	Redundant Fibre Channel SAN	NAS / iSCSI	Direct
Availability (typical)	Up to 99.999%	up to 99.999% mostly 99.99%	up to 99.99% mostly 99.9%	up to 99.9%	up to 99.9% mostly 99.5%
Data Protection (typical)	Mirroring (e.g. RAID 0/1)	Mirroring (e.g. RAID 0/1)	RAID 5	RAID 5	RAID 5
RPO - acceptable data loss (typical)	0 hours	typically 0 hours	8 hours	24 hours	3 days
RTO - time to restore (typical target)	4 hours	4 hours	24 hours	3 days	7 days
Performance (typical IOPS per disc)	>6,000 IOPS	175 IOPS	125 IOPS	125 IOPS	75 IOPS

- **Raw (TB):** Amount of Raw Disk formatted for use.
- Report by Tiers
- Nearline (or Near-online) Storage: (Note: this excludes VTL which is categorized as Tier 4 storage) a term used to describe an intermediate type of data storage. It is a compromise between online storage (constant, very rapid access to data) and offline storage (infrequent access for backup purposes or long-term storage). It is called so because the storage system knows on which volume (cartridge) the data is, and usually asks a robot to retrieve it from this physical location (usually a tape library) and put it into a tape drive to access it and thus bring the data it contains online. This process is not instantaneous, but it only does require a few seconds, hence the initial description.
- Deep Storage: another description for offline storage, usually tape archives or other media used for archive backups, where the data media needs to be accessed and loaded onto a suitable device to locate the required files. Hence the data is not constantly online and available to users, but needs to be specifically requested with a time lag.

Storage Cost
Costs / spending data collection

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Storage Spending & Staffing					
	Total				
Sourcing Type		Insourced	Outsourced	Contractor	Maintenance
Spending					
Non-Personnel					
Hardware	$0	$0	$0		$0
Software	$0	$0	$0		$0
Connectivity	$0	$0	$0		$0
Disaster Recovery	$0	$0	$0		$0
Occupancy (Non-Data Center Floor Space)	$0	$0	$0		$0
Unallocated (Non-Personnel)	$0	$0	$0		$0
Total Non-Personnel	$0	$0	$0		$0

- Report annual hardware, software, connectivity and disaster recovery costs here, grouped by sourcing types
- Costs much match the workload supported
- Hardware: Annual expense, lease, depreciation, maintenance, installation and taxes, as appropriate, for all hardware assets
- Software: Annual license and maintenance costs, as well as costs associated with new purchases and upgrades
- Connectivity: Annual costs paid by agency for any dedicated to storage only network
- Disaster Recovery: Dedicated costs only, such as a contract or fully dedicated (no production)
- Unallocated: For input of costs where a breakdown is unknown such as outsourcing

Source: Gartner, Inc.

Storage Cost Definitions

- Hardware: Annual depreciation, expense, lease and maintenance for storage hardware: If depreciation is not available, take ¼ of purchase price in last four years. Includes:
  - Storage Controllers, Storage Servers: All dedicated storage hardware devices including controllers, servers, disk arrays, tape libraries, optical jukeboxes. It also includes the equipment used by the operations staff to support the storage environment (e.g., desktops, laptops, smartphones).
  - Offline Supplies (Media): Portable media used to store data offline such as tapes
- Software: Annual license purchases and software maintenance dedicated to managing the storage systems. Software is not depreciated. This includes creation and setup, storage maintenance, reporting, security, monitoring, backup/restore, archival, replication, media handling and data migration/tiering.
- Connectivity: Annual costs of dedicated storage network devices and cables/connections used solely for access to shared storage devices. If server traffic and/or storage traffic shares the general data network, do not separate here.
- Disaster Recovery: Annual costs of devices, software, connectivity and contracts specifically dedicated to storage management
- Occupancy (Non-Data Center Floor Space)Note: Expenses related to data center facilities management are included in the Facilities functional area, Occupancy costs should include fully burdened costs for the non-data center floor space being used by the staff supporting the storage environment under analysis. Some examples include office space, furniture, electricity, maintenance, property taxes, security and office supplies.

Storage Personnel Cost
Personnel costs data collection

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Sourcing Type		Insourced	Outsourced	Contractor	Maintenance
Budget Type		Direct	Direct	Direct	Direct
Region Located					
Personnel	$0	$0	$0	$0	$0
Unallocated (Total Cost)	$0	$0	$0		$0
Total Cost	$0	$0	$0	$0	$0

- Report fully burdened personnel costs for all FTEs and any outsourcing, grouped by sourcing types.
- Although Gartner will ask for FTE counts by categories (see next slide), such as operations, technical etc. it is not necessary to report the costs for each individual FTE. That is, the cost reported under Personnel is for all of the FTEs reported in the staffing section.
- For in-house staff, personnel costs include salary (including overtime pay), benefits and “other” employee costs such as travel and training.
- “Benefit load” should include costs for bonuses, paid holidays, vacation, medical/dental coverage, life and accident insurance, retirement plans, stock plans, disability, social security, unemployment compensation, dependent care, tuition reimbursement and employee assistance programs (for example, physical exams, exercise programs and similar costs). Exclude costs related to human resource department staff allocations, early retirement incentive bonuses and internal “cross-charges” for corporate overhead such as for the chairperson’s salary.
- For contractors and consultants, include all compensation that was paid directly to the individual.

Source: Gartner, Inc.

Storage FTE
Personnel FTE data collection

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Sourcing Type		Insourced	Outsourced	Contractor
Budget Type		Direct	Direct	Direct
Staffing				
Operations / Maintenance	0.00	0.00		0.00
Engineering / Technical Services	0.00	0.00		0.00
Planning & Process Management	0.00	0.00		0.00
Services Administration	0.00	0.00		0.00
Management & Administration	0.00	0.00		0.00
Unallocated (Total FTE)	0.00	0.00		0.00
Total FTE	0.00	0.00		0.00

- Report FTEs, in-house and contractors, by role. A person should not be counted more than once. The total cost for the FTEs is reported in the Personnel cost section (see previous slide).
- Management of functions are included and may need to be prorated across multiple towers. For example, a Data Center Operations Manager may be allocated across servers.
- Administration is in-scope, this includes portions of individuals managing contracts, asset management etc. Note that this is within the tower being analyzed.
- If a role is less than 5% of someone's time, it may be excluded.

Source: Gartner, Inc.

Storage FTE
Personnel FTE data collection

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- Operations/Maintenance
  - Task management related to storage devices and media — a general process to manage specific IT tasks, operational processes and output associated with daily storage management operations, to ensure they are resourced appropriately and all relevant stakeholders are included in decisions, authority, implementation and communication as appropriate. These personnel specifically have responsibility for overall efficient operation of installed storage systems, such as system start/stops, monitoring systems, responding to console messages, diagnosing and correcting problems and failures etc.
  - Disk Storage Management: Tasks pertaining to disk arrays, controllers, and other online storage devices
  - Tape Support: Tasks pertaining to tape libraries, archived media, and other nearline or offline storage devices

Source: Gartner, Inc.

Storage FTE
Personnel FTE data collection

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- Engineering/Technical Services
  - Second tier support of the storage management systems relating to performance monitoring, root cause analysis of problems, capacity monitoring and management, change and release management, security management etc.
  - Change and Release Management: This is designed for the efficient and effective handling of Changes — installations, add, moves and change. Includes evaluation, installation, maintenance (e.g., fixes and upgrades) as well as removal. The Release process takes a holistic view of Changes to IT services, considering all aspects of a Release both technical and non-technical. It is responsible for all legal and contractual obligations for all hardware and software in use within the organization.
  - Problem and Incident Management: Detection and recording through diagnosis to resolution and closure, but not the first-line IT Service Desk. Manages all major Incidents and Problems, while endeavoring to record all workarounds and "quick fixes" as Known Errors where appropriate, also raising Changes to implement permanent structural solutions wherever possible. Problem Management further analyses and trends Incidents to proactively prevent the occurrence of repeat or associated Incidents and Problems. Includes systems administrators.
  - Performance Monitoring and Management: Specifically, this process establishes technical standards, monitors key components of the infrastructure and applications services to collect metrics for review, takes key measures and reports, and reviews them against targets, to determine if actions are required to manage the service more compliantly. Involves tuning system performance in reaction to monitoring work. Measures include availability, reliability, maintainability, serviceability and security.
  - Capacity Planning: This area establishes the performance and capacity thresholds for storage system changes. Technical services personnel monitor system utilization and forecast capacity needs. Responsibilities include the following items: Evaluate and recommend new hardware, Plan upgrade schedules
  - Storage Security Management: Planning and managing a defined level of security for information and IT services in relation to storage, including all aspects associated with procedures for and reaction to security incidents. It also includes the assessment and management of risks and vulnerabilities, and the implementation of cost justifiable countermeasures

Source: Gartner, Inc.

Storage FTE
Personnel FTE data collection

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- Planning and Process Management
  - Systems Researching and Planning: Covers activities related to the planning for and management of, current and future technology needs. This includes activities such as project portfolio management, the development of plans for major initiatives such as mass product or application migrations, and research of new technologies. Also design, build, evaluation and testing of new products, packages, systems, tools.
  - Process Development and Management: Development and establishment of formal policies and documentation around the connected sets of activities that define IT processes for storage, plus the ongoing oversight and control (but not the actual carrying out) of these processes. Processes include, but are not limited to, Configuration management, Incident/Problem management, Change Management, Release Management, Security Management.
  - Project Management: Specific labor overhead for project management and QA on change and release implementations. Includes activities related to organizing and managing IT resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints. A project is a temporary and one-time endeavor undertaken to create a unique product or service. It is important to note that this category includes only the organizing and managing of IT projects, and not all the activities that are a part of an IT project. Project Management Office (PMO) personnel are generally included in this category. Activities other than organizing and managing should be included in the Technical Services/Engineering, Operations, or Management categories.
  - Storage Disaster Recovery: Apportioned specifically to storage (if possible).

Source: Gartner, Inc.

Storage FTE
Personnel FTE data collection

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- Services Administration
  - Budget, Chargeback and Service Level Reporting
  - Product Management
  - IT Training (training taken by IT staff)
  - Asset Management
  - Procurement
  - Asset and Configuration Tracking
  - Business and Relationship Management
  - Contract and Service Provider Management
- Management and Administration
  - Tasks include but are not limited to setting strategic direction, communications activities, hiring and firing of staff, personnel performance reviews, expense management, approving relevant documents, planning day to day personnel workload etc. Time spent by managerial personnel on non-supervisory or departmental administration tasks (for example a data center supervisor who spends half his time managing servers) should be represented in the relevant category.
  - IT Administration: Support staff for IT managers which typically include secretary, receptionist and administrative assistant, who provide direct administrative and clerical support.

Storage
Frequently Asked Questions

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- Question: Regarding 1-3 TB desktop storage devices, should this capacity be counted? No, these devices are not included in Storage
- Question: Where should the software cost associated with SAN storage be allocated? Specifically, the cost of the PowerPath/Navisphere agents that run on the server-side to enable connectivity to the SAN infrastructure? Answer: Navisphere server and agent (monitoring) license expenses (as defined in Software) belong in Storage
- Question: What about de-duplication and thin provisioning? Answer: Take out the compression and calculate actual capacity.
- Question: How do you allocate NAS Appliances vs. NAS Servers? Answer: NAS Appliances are traditional units which run a proprietary operating system. They are not patched or maintained in the way that standard servers are maintained. Examples include: Network Appliance, EMC Celerra, etc. They are included as storage cost only; do not count as Storage servers.
- Question: How do we classify BIA (Business Intelligence Accelerator) type of storage technology (e.g. EMC Green Plum, Exadata, etc.)?
- Answer: Exclude this capacity from the Storage workload totals. This should be considered “internal disk” rather than external arrays, so these costs should be included in the appropriate server area

Facilities
Data model

Non-Personnel	▪ Building and Maintenance ▪ Utilities ▪ Environmental Systems ▪ Electrical Systems ▪ Other Systems
Personnel	▪ Environmental Control ▪ Design and Consulting ▪ Security ▪ Administration (includes management)

- The Data Center is the department in an enterprise that houses and maintains back-end information technology (IT) systems and data stores—its mainframes, servers and databases.
- Intermediate distribution frames are excluded.
- Cost: The Facilities model captures the costs associated with operation of Data Centers, including building, power and mechanical.
- This form should only be completed by agencies that have a Data Center.

Facilities Workload

Please complete column for each Data Center			
Data Center Demographics			
Name of Data Center			
Hours of Service (Operational Hours Per Week)	0	0	0
Data Center Building - Floor Space			
Data Center Floor Space: Total (Sq. Ft.)	0	0	0

- There are three columns in order to provide information for multiple data centers.
- Data Center Floor Space Total Square Feet Includes:
  - Occupied Capacity: Raised Floor and / or Slab Using Overhead Cable Trays
  - Space required for operational devices such as servers, storage, network, mainframe, tape drives, consoles, network operations center, production control office space etc.
  - Occupied Capacity: Facilities Support Space
  - Space required for ancillary equipment such as UPS, air conditioning, power distribution, DR, etc.
  - Occupied Capacity: Integral Office Space
  - Data center staff not occupying the raised floor or slab but still within the data center facility.
- If your agency has a colocation agreement and square footage information is unavailable, please let DIS and Gartner know.

Facilities
Costs / spending data collection.

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Data Center - Facilities					
Name	Totals	Facilities	Facilities	Facilities	Facilities
Sourcing Type		Insourced	Outsourced	Contractor	Maintenance
Spending					
Non-Personnel					
Building and Maintenance	$0	$0	$0		$0
Total Utilities	$0	$0	$0		$0
Mechanical and Electrical Systems	$0	$0	$0		$0
Unallocated (Non-Personnel)	$0	$0	$0		$0
Total Non-Personnel	$0	$0	$0		$0

- Report annual cost for data center expenses including:
  - Building and Maintenance: This includes data center expense for lease, depreciation, rental, installation and taxes
  - Total utilities
  - Mechanical and Electrical
- Unallocated: For input of costs where a breakdown is unknown such as outsourcing/colocation

Facilities Cost Definitions

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- Building and Maintenance: This includes data center expense for lease, depreciation, rental, installation and taxes, inclusive of maintenance and upkeep of walls, floors, ceilings, carpeting and office area improvements. Include floor space costs for Enterprise Computing, Storage and Networks personnel who work within the confines of the data center. Exclude any co-located office space or other non-data center building costs.
- Utilities
  - Utilities – Electricity: This includes the electricity cost for all data center equipment.
  - Utilities – Water and Gas: This includes the water and gas costs for all data center equipment.
- Mechanical and Electrical Systems
  - Environmental Systems: This includes costs for air conditioning (CRACs), chillers, humidifiers, fans and associated piping and ducting.
  - Electrical Systems: This includes costs for power distribution units (PDUs), uninterruptible power supply (UPS), backup generators / batteries, cabling and electrical conduits.
  - Other Systems: This includes costs for fire prevention and suppression, building management systems (BMS), data center infrastructure management (DCIM), lighting, heating and physical / logical security systems.
- Unallocated: For input of costs where a breakdown is unknown such as outsourcing

Facilities Personnel Cost
Personnel costs data collection

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Sourcing Type		Insourced	Outsourced	Contractor	Maintenance
Budget Type		Direct	Direct	Direct	Direct
Region Located					
Personnel	$0	$0	$0	$0	$0
Unallocated (Total Cost)	$0	$0	$0		$0
Total Cost	$0	$0	$0	$0	$0

- Report fully burdened personnel costs for all FTEs and any outsourcing, grouped by sourcing types.
- Although Gartner will ask for FTE counts by categories (see next slide), such as operations, technical etc. it is not necessary to report the costs for each individual FTE. That is, the cost reported under Personnel is for all of the FTEs reported in the staffing section.
- For in-house staff, personnel costs include salary (including overtime pay), benefits and "other" employee costs such as travel and training.
- "Benefit load" should include costs for bonuses, paid holidays, vacation, medical/dental coverage, life and accident insurance, retirement plans, stock plans, disability, social security, unemployment compensation, dependent care, tuition reimbursement and employee assistance programs (for example, physical exams, exercise programs and similar costs). Exclude costs related to human resource department staff allocations, early retirement incentive bonuses and internal "cross-charges" for corporate overhead such as for the chairperson's salary.
- For contractors and consultants, include all compensation that was paid directly to the individual.

Source: Gartner, Inc.

Facilities FTE
Personnel FTE data collection

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Staffing (number of FTEs)		Insourced		Contractor	
Operations and Engineering	0.00	0.00		0.00	
Management and Administration	0.00	0.00		0.00	
Unallocated (Total FTE)	0.00	0.00		0.00	
Total FTE	0.00	0.00		0.00	

- Report FTEs, in-house and contractors, by role. A person should not be counted more than once. The total cost for the FTEs is reported in the Personnel cost section (see previous slide).
- Management of functions are included and may need to be prorated across multiple towers. For example, a Data Center Operations Manager may be allocated across servers.
- Administration is in-scope, this includes portions of individuals managing contracts, asset management etc. Note that this is within the tower being analyzed.
- If a role is less than 5% of someone's time, it may be excluded.

Facilities FTE
Personnel FTE data collection

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- Note: Facilities does not include monitoring and management of computing equipment (including server racks) and storage devices (including storage cabinets). Support for these assets is included in the Servers and Storage functional areas.
- Operations and Engineering
  - The management of physical data center premises, and other facilities and services associated with the premises such as furniture, power supply, heat management, climatization services, access security, floor space, office space, design and consulting.
- Management and Administration
  - Includes managers of operations, maintenance, technical services, engineering and technical design and evaluation teams within the data center, plus associated administrative support personnel who directly support data center facilities.
  - Could be specific line managers within the data center, or an apportionment of central IT management (if it is judged to represent more than 15% of his/her total hours). Tasks include but are not limited to setting strategic direction, communications activities, hiring and firing of staff, personnel performance reviews, expense management, approving relevant documents, planning day to day personnel workload etc. Time spent by managerial personnel on non-supervisory or departmental administration tasks (for example a data center supervisor who spends half his time managing servers) should be represented in the relevant category.
  - IT Administration: Support staff for IT managers which typically include secretary, receptionist and administrative assistant, who provide direct administrative and clerical support for data center facilities.
  - Management: Equivalent FTEs of time spent on strategic and administrative tasks for data center facilities as outlined above by IT line managers or an apportionment of central IT management (if it is judged to represent more than 15% of his/her total hours). Be careful not to double count managers in your apportionments to this, and other tasks, total FTEs should not exceed total heads.